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operation. Platinum vessels are seriously damaged, becoming brittle, and at the same time increasing in weight, owing to the deposition of iron from the iron carbonyl formed in the passage of the gas through iron pipes. A similar deposit, which can not be wiped off, is formed on the bottom of porcelain crucibles, precluding the use of such crucibles in quantitative analysis. It was found that a very considerable quantity of unconsumed carbon monoxid escaped into the air, so that this could easily be injurious to health. In a laboratory where thirty coal-gas burners may be kept going without detriment to health, hardly eleven water-gas burners can be used with impunity. In the ensuing discussion of the paper it was suggested that where the water gas is carburetted, as is usual in this country, it is probable that it is less objectionable as a laboratory fuel.

YELLOW ARSENIC.

THE yellow modification of arsenic, which has been observed by several chemists, has been submitted to a careful examination by Erdmann and Unruh, and their results are published in the *Zeitschrift für anorganische Chemie*. The yellow arsenic corresponds to white phosphorus, and is produced by rapidly cooling the vapor of arsenic. In practice the best method was found to be sublimation in a tube of aluminum in an atmosphere of inert gas. The fumes are cooled rapidly by absorption in carbon bisulfid, in which yellow arsenic is soluble. When a saturated solution is cooled to -70° it deposits the yellow arsenic in the form of a yellow powder, which can be preserved at this temperature without change if kept in the dark. When exposed to light, even in solution, it is rapidly changed to ordinary arsenic. After a time a brownish-red precipitate is formed in the carbon bisulfid solution which seems to be a fourth modification, and reminds one of red phosphorus. The molecular weight of the yellow arsenic was determined, and the molecule corresponds to As_4 .

COPPER CYANID SOLUTIONS.

IN the same journal is a paper by F. P. Treadwell and C. v. Girsewald on the colorless

solution of copper cyanid, which is not precipitable by hydrogen sulfid, and which is very familiar to all students of qualitative analysis. The compound present in this solution is variously given in different text-books, some considering it merely a double cyanid of bivalent copper and potassium, as $K_2Cu(CN)_4$, while others affirm that the copper is present in univalent form, being reduced by the potassium cyanid. For this the formula $KCu(CN)_2$ is sometimes given. In both cases it appears wholly a matter of mere conjecture. The authors studied solutions containing various proportions of copper and potassium cyanid, and arrived at the conclusion that the salt present is $K_4Cu_3(CN)_{10}$, though the salt itself was not isolated. The complexity of the ion which is not decomposed by hydrogen sulfid was determined to be $[Cu_3(CN)_6]^{iv}$, by the use of cryoscopic methods.

CORROSION OF IRON WATER MAINS.

AN interesting case of corrosion is reported from Frankfurt in the *Zeitschrift für angewandte Chemie*, by Martin Freund. This pipe contained in places holes as large as the palm of the hand. On the edges of these holes the iron had been converted into a dense, dark gray, soft mass resembling graphite. Analysis showed the mass to be composed of ferrous phosphate, ferrous silicate, carbon, and ten per cent. of metallic iron. As the surrounding soil could not have supplied the phosphorus or silicon, it appeared that all the materials had come from the iron itself. By the action of stray electric currents the phosphorus and the silicon of the iron had been oxidized to phosphate and silicate. In order to test this supposition, Freund subjected a portion of the cast iron of the pipe as anode to the action of an electric current in a dilute salt or gypsum solution, and found that in a short time the iron became coated with a deposit containing phosphate and silicate of iron, and in every respect resembling the corrosion product of the pipe.

J. L. H.

A QUARTERLY ISSUE OF THE 'SMITHSONIAN MISCELLANEOUS COLLECTIONS.'

THE Smithsonian Institution has commenced the publication of a Quarterly Issue

of its 'Miscellaneous Collections,' 'designed chiefly to afford a medium for the early publication of the results of researches conducted by the Smithsonian Institution and its bureaus, and especially for the publication of reports of a preliminary nature.' The first number of the Quarterly Issue is a double one and contains seventeen articles, ranging in size from 1 page to 73 pages, in addition to notes on the activities of the institution, its collections, etc., the whole accompanied with fifty-six plates and numerous text figures. The scope of the journal is broad, the first issue embodying articles on mammalogy, astrophysics, paleontology, archeology, geology, ornithology, ichthyology, ethnology, etc., thus covering a considerable range of scientific subjects. The number in hand opens with a description of 'Seventy New Malayan Mammals,' by Gerrit S. Miller, Jr., based on collections made and presented to the National Museum by Dr. W. L. Abbott. Mr. C. G. Abbott presents the results of 'Recent Studies of the Solar Constant of Radiation,' conducted at the astrophysical observatory of the institution, under the direction of Secretary Langley. Another paper by Mr. Abbott describes 'The New Cœlostast and Horizontal Telescope of the Astrophysical Observatory,' in which are given the results obtained with a device designed by Secretary Langley for the purpose of 'churning' a column of air traversed by a solar beam, with the view of reducing the 'boiling' or confusion of all parts of the solar image due to variability of the strata of air traversed. Dr. F. W. True presents some photographic illustrations of 'Living Finback Whales from Newfoundland,' these being the first photographs of living whales in American waters that have thus far been published. Brief descriptions of 'A Skeleton of *Hesperornis*,' and 'A New *Plesiosaur*,' by Mr. Frederic A. Lucas, are given with plates, and Mr. W. H. Holmes illustrates and compares the designs on some remarkable 'Shell Ornaments from Kentucky and Mexico.' A noteworthy specimen of a 'Glacial Pothole in the National Museum' is described by Mr. George P. Merrill, who explains the method by which

the specimen was procured. 'Some Notes on the Herons of the District of Columbia,' by Mr. Paul Bartsch, who made a systematic survey of two heron colonies and conducted experiments with a view of solving some of the problems of bird life, is of special interest. Dr. J. Walter Fewkes gives a 'Preliminary Report on an Archeological Trip to the West Indies,' in 1903, describing particularly the remarkable objects of stone, bone, shell, wood and pottery which he collected during the trip, and giving an insight into their various uses. Dr. C. M. Child, of Chicago University, describes the 'Form-regulation in Cœlentera and Turbellaria,' of which he made a special study during his occupancy of the Smithsonian seat at the Naples Zoological Station, and Dr. Carl H. Eigenmann introduces some 'New Genera of South American Fresh-water Fishes, and New Names for Some Old Genera.' Of timely interest is the account of 'Korean Headdresses in the National Museum,' by the late Foster H. Jennings, in which are described and illustrated twenty-four varieties of Korean hats and other headgear, including headband buttons and hatpins for topknots. A brief history of the 'Hodgkins Fund of the Smithsonian Institution,' and of what has been accomplished with its income toward 'the increase and diffusion of more exact knowledge in regard to the nature and properties of atmospheric air in connection with the welfare of man,' bears the name of Helen Waldo Burnside, and is accompanied with an illustration of the beautiful Hodgkins medal. Mr. A. B. Baker gives an account of 'A Notable Success in the Breeding of Black Bears,' which is of special interest to those having charge of animal collections. Of quite a different theme is Dr. James M. Flint's 'Chinese Medicine,' which briefly explains the origin of medicine and the theory of disease in the Celestial Empire. The last of the series of articles consists of 'Notes on the Rocks of Nugsuaks Peninsula and its Environs, Greenland,' by W. C. Phalen, the remaining pages of the journal being occupied by brief descriptions of various activities of the institution and their results.